REMARKS

I. Summary of the Examiner's Action

A. Claim Rejections

In paragraph 2 of the Office Action, the Examiner rejected claims 1 – 11 and 16 – 19 under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 5,903,724 to Takamoto *et al.* (hereinafter "the Takamoto patent") in view of United States Patent No 6,122,280 to Hamai *et al.* (hereinafter "the Hamai patent").

In paragraph 12 of the Office Action, the Examiner rejected claims 12 – 15 under 35 U.S.C. § 103(a) as being unpatentable over the Takamoto patent in view of the Hamai patent as applied to claim 1, and further in view of United States Patent No. 6,564,382 to Duquesnois *et al.* (hereinafter "the Duquesnois patent").

II. Applicants' Response – Formal Matters

A. Amendments to the Specification

Applicants have amended the paragraph beginning at page 6, line 11 to make reference to the application numbers of the co-pending applications which were incorporated by reference in the present application.

B. Amendments to the Claims

Applicants have corrected the grammar of claim 14 wherein the word "in" was mistakenly substituted for the word "is".

III. Applicants' Response – Claim Rejections Under 35 U.S.C. § 103(a)

Before discussing Applicants' response to the Examiner's rejections, Applicants would like to discuss Applicants' invention and each of the references relied upon by the Examiner.

A. Applicants' Invention

Applicants' invention concerns a business method for transmitting information over a network. In contrast to the present use of networks, such as in the Internet, where users submit information for immediate transmission, Applicants' invention concerns a method wherein a user submits information for transmission at a desired time. The Applicants' invention

> receives a request for transmitting digital information after a start time and before an end time, determines the time required to transmit the digital information based on the number of packets in the information and the network speed, schedules a transmit time for the digital information, and accepts the digital information for transmission only if the time required to transmit is less than or equal to the difference between the transmit time and the end time.

Application, Page 4, lines 7 – 12.

Applicants' invention thus provides users with additional options for using networks, *e.g.*, the Internet, to transmit information. Instead of submitting each information job for immediate transmission as in the prior art, users may submit information transmission jobs for transmission at a desired time, and in variants of the invention, at a first price (*see* claim 2), and in further variants, at a second price (*see* claim 4).

Applicants' invention thereby overcomes limitations of the prior art:

> Current TCP/IP file transmission packages (FTP, HTTP) do not support scheduled pacing and preemption of data flow. TCP/IP stack and network is available only on a "first come, first served" basis. FTP and HTTP do not have scheduling capabilities to start sending the file at a given time (they just start "now").

Application, Page 2, line 21 – Page 3, line 4. Additional aspects of Applicants' invention overcome other limitations having to do with the fact that the "prior art has not been able to apply scheduling or dispatching techniques to deal with: priority information; staggered information; quality of service; queue length and buffer constraints; bandwidth constraints; and information delivery during specific time intervals." Application, Page 3, lines 17 – 19.

An example of the operation of Applicants' invention starts at page 35, line 15 and illustrates the various features not found in the prior art:

> Figure 7A shows an example transmission request 700A. In this non limiting example, a subscriber such as a product or service provider, e.g. an insurance company providing digitized training videos, located at the source address 710, to its representatives (recipients 750), requests that the videos 710 be sent out over a weekend in order to be used in a course in the following week (transmission deadline 744). The company (billing account 730) requests a quality of service which provides ten megabits of bandwidth (bandwidth constraint 752), collection of acknowledgments 760 from the representatives, and a maximum of two retransmissions (retransmission count 748). The video is 3.6 Gigabytes long (expected data file size 722), approximately two hours of MPEG-2 compressed audio and video, and there are two groups of recipients: group B, the insurance agents, and group D, state regulators (see values in recipients field 750) . . .

This description of Applicants' invention is provided to assist the Examiner in understanding the differences between Applicants' invention and the references cited by the Examiner. It in no way intends to limit the scope of Applicants' invention.

B. References Cited By Examiner

1. The Takamoto Patent

In contrast to Applicants' invention which concerns providing a new option wherein information transmission jobs can be scheduled for transmission over a network at a specified time, price, priority and other criteria, two of the references relied upon by the Examiner concern improving the efficiency of packet transmission at or near the hardware level and have little to do with higher-level end-user considerations apparent in Applicants' invention.

For example, the Takamoto patent concerns a method for transmitting information in packets wherein imperfect transmission is expected and individual packets may need to be retransmitted. According to Takamoto, in the prior art several unsatisfactory methods have been employed, *e.g.*, generating an acknowledgement for each packet that is successfully received, or generating an acknowledgement after an arbitrary number of packets have been received. The Takamoto describes these methods as generally unsatisfactory and inefficient.

In particular, the latter method of aggregating packets into a cluster for which a block acknowledgement is generated "is effective only if all data is transmitted normally . . . (on the other hand) when data transmission does not occur normally [i]f retransmission overhead is taken into consideration in an environment of a high probability of data loss, the data transfer can be lower than that of the earlier method." Takamoto patent, Column 4, lines 4 – 20.

In order to overcome the purported limitations of the prior art, Takamoto proposes a method in which successive packets are still aggregated for the purpose of

acknowledgement in the case of successful transmission, but in which a "sub-ACK" unit is generated for each successive sub-packet. More particularly,

> "[a]ccording to the present invention, one ACK unit is divided into a plurality of sub-ACK unit packets each furnished with a tag indicating the pre-division position. The divided packets are transmitted sequentially. Upon receipt of each divided packet, the receiving side communication controller returns a sub-ACK comprising the result of the reception to the transmitting side communication controller. Having received all packets, the receiving side communication controller determines the order of the packets as per the contents of their tags indicating the pre-division position and merges their data parts."

Takamoto patent, Column 4, lines 21 – 31. The Takamoto method then "checks the received sub-ACK's for the result of the reception" to see if any packet corresponding to a sub-ACK is missing and therefore requires retransmission. The next step according to Takamoto's method occurs:

> [w]hen all sub-ACK's have been normally received the transmitting side puts them into a single ACK and notifies the request source thereof. Because one ACK unit is divided into a plurality of sub-ACK unit packets for consecutive transmission, data transfer performance is enhanced. Since a packet retransmission request may be issued for each sub-ACK, drops in the transmitting performance are minimized in long-distance communication setups.

Takamoto patent, Column 4, lines 36 – 42. Thus, in contrast to Applicants' invention which is concerned with providing scheduled alternatives to the "start now" transmission paradigm, the Takamoto patent is concerned with improving the performance of a packet transmission process.

2. <u>The Hamai Patent</u>

According to the Hamai patent, its "invention relates to a packet output device for reducing the load of a packet generator of the data transmitting device by adding transmission time data to the data packets." Hamai patent, Column 1, lines 7 – 10. The Hamai packet generator overcomes the limitations of the prior art packet generator which is described as comprising "a packet generator 31, a packet transmitting circuit 32 and a clock signal generator 37." Hamai patent, Column 1, lines 52 – 53. The prior art packet generator

> must generate and transmit the packets to the transmitting path 34, based on the clock time defined by the clock signal generated from the clock signal generator 33. For this reason, the packet generator 31 is required to constantly monitor the clock time and perform predetermined operations for each transmission cycle C_j, i.e., the packet generator 31 should perform a timing control on the order of μsec. This increases the load on the packet generator 31. For example, when the packet generator 31 is implemented using a microcomputer, it is necessary for the microcomputer to constantly monitor the clock time, thus reducing the time available for executing other tasks for operation processes.

Hamai patent, Column 2, line 59 – Column 3, line 4.

Thus, similar to the Takamoto patent, the Hamai patent is concerned with improving a specific aspect of a packet transmission process.

3. The Duquesnois Patent

Unlike the previous references relied upon by the Examiner which concern various aspects of packet transmission technology, the Duquesnois patent concerns a "method of playing a set of multimedia applications, which allows a better synchronization and real-time playing of audio and video frames." Duquesnois patent, Column 1, lines 48 – 51. The Duquesnois patent describes various situations in which a

multimedia player and a browser or multimedia player and CPU cooperate to display or perform some other function on multimedia. It is not unusual if the various programs are not operating in a synchronized manner – *e.g.*, there are frame rate mismatches. Thus Duquesnois concludes that in "the method according to the prior art, each multimedia application contains its own scheduler, and runs it in its own thread. So, even if all application-intrinsic tasks are synchronized, the overall application is not necessarily synchronized." Duquesnois patent, Column 1, lines 53 – 57.

In order to overcome the limitations of the prior art, the Duquesnois patent describes a method that creates a common scheduler to control the operation of *e.g.*, a browser and multimedia player, so that they "remain synchronized while having real time playing." Duquesnois patent, Column 2, line 13.

In further embodiments of the method described in the Duquesnois patent, the common scheduler sets priority levels in order to restore synchronization:

> When the difference between the previous target time and the new one becomes larger than a given threshold, the task will reduce the amount of processing it will perform so as to allow the overall application to restore synchronization. To this end, the method of playing a set of multimedia applications further comprises a step of giving a priority level to a task and the scheduler controls the execution of the tasks as a function of the target time and the priority level of said task.

Duquesnois patent, Column 4, lines 44 – 52. In a practical situation, the preferred embodiment of the Duquesnois patent would assign the "highest priority level . . . to the audio decoding and rendering task, then to the video decoding task, then to the video rendering task and finally the lowest priority level is given to the browser display updating task itself." Duquesnois patent, Column 4, line 54 – 58.

C. Rejection of Claims 1 – 11 and 16 – 19 under 35 U.S.C. § 103(a)

1. Independent Claim 1

The Examiner rejected claims 1 – 11 and 16 – 19 under 35 U.S.C. § 103(a) as being unpatentable over the Takamoto patent in view of the Hamai patent. For several reasons Applicants respectfully submit that whether taken singly or in combination, neither the Takamoto patent nor the Hamai patent depicts, describes or suggests the subject matter of claims 1 – 11 and 16 – 19.

First, and most importantly, Applicants' invention as recited in independent claim 1 and described throughout their disclosure is concerned with providing a scheduled alternative to the "transmit now" paradigm of networks like the Internet, whereas both the Takanmoto and Hamai patents are concerned with improving different aspects of packet transmission.

Review of Applicants' preceding description of their own invention indicates that in contrast to the prior art where information is presented for immediate transmission to a network, in Applicants' invention a user specifies a desired transmission slot which accompanies the digital information to be transmitted. This user-specified time information is then used by a scheduling algorithm to determine if the information can be transmitted in the desired time slot. If so, the information is accepted for transmission. *See* Claim 1.

The Takamoto and Hamai patents are not concerned with providing an alternative to the "transmit now" paradigm of current networks like the Internet. Rather, they concern improving various and unrelated aspects of packet transmission. As previously described, the Takamoto patent concerns a method using "sub-ACKs" to

improve the efficiency of packet transmission where packets are expected to be dropped and therefore the need for retransmission will occur. According to Takamoto, the use of "sub-ACKS" will generally reduce the size of packets that are retransmitted when packets are dropped resulting in an improvement of the overall efficiency of packet transmission.

Whereas the Takamoto patent is concerned with improving the efficiency of packet transmission in environments where packets will be dropped, the Hamai patent is concerned with reducing the computational load on systems controlling packet transmission. In order to reduce the computational burden on hardware controlling a packet transmission process, Hamai's method generates time information for each new data packet. According to Hamai, this eliminates the need for the packet generator to monitor the conditions of the transmitting path and the clock time, and further provides apparatus and method for transmitting packets in accordance with the corresponding time data which is generated in the data packet generator and is added to the respective data packets.

Although the Hamai patent does use time information to control packet transmission, the time information is not specified outside of the packet creation process (by, *e.g.*, a user desiring to transmit information over a network) as in the case of Applicants' invention, but rather is specified by the packet generator itself.

Thus, even when combined, the subject matter of the Takamoto and Hamai patents simply do not describe or suggest the subject matter of independent claim 1 since the combined subject matter still concerns the details of packet transmission, and not scheduled data transmission over a network as in the case of Applicants' invention.

Second, assuming for the sake of argument that the Examiner construes claim 1 so broadly as to read on the details of a packet transmission process (Applicants in no way agree that this would be proper since claim 1 is unconcerned with such details), the combination still would not describe or suggest the subject matter of claim 1. In making his rejection, the Examiner selectively ignored aspects of the method described in the Takamoto patent and deleted steps of the Takamoto method – *e.g.*, the use of sub-ACKs; the recording of position data for reconstructing data packets from sub-packets, etc. – each of which were described as essential elements of Takamoto's invention. Therefore, the Examiner improperly changed the principles of operation of the Takamoto patent. *See* MPEP § 2143.

In like manner, the Examiner selectively ignored essential aspects of the Hamai patent, *e.g.*, the packet generator generates time data for each data packet, again changing the principle of operation of an invention in a relied-upon reference. There is no teaching in the Hamai patent that time data need not be generated for each data packet.

Accordingly, a proper combination of the Takamoto and Hamai patent would require the use of sub-ACKs and time data for each data packet. Any other combination would effectively, and improperly, change their respective principles of operation. Since claim1 is nowhere concerned with these details and does not mention either synonymously or *in haec verba* the use of sub-ACKs or the generation of time data for each data packet, the combination of Takamoto and Hamai does not describe or suggest the subject matter of claim 1.

Third, Applicants respectfully submit that there is no incentive to combine the references in the manner of the Examiner and that, in fact, the disclosure of the Hamai

patent would teach away from the combination. After all, the stated objective of the Hamai patent is to provide a method that reduces the need for the packet generator to monitor the congestion of the network and clock time, thereby reducing computational overhead and increasing the time available for other tasks. In contrast to the method of Hamai, the Takamoto method constantly monitors the congestion of the network to determine if transmission efficiency could be improved by reducing the size of the data packets. *See* Takamoto patent, Column 12, lines 12 – 54. In addition, the Takamoto method generates a significant computational overhead associated with creating sub-ACKs for sub-packets; calculating position data for each sub-packet and including that information in the sub-ACK etc. The desire to reduce computational overhead would teach away from the combination of the Takamoto and Hamai patents.

Finally, Applicants make clear that their invention as described and claimed is actually intended to solve problems caused by the utilization of packet transmission in networks, and not by providing an improved packet transmission scheme as in the case of Takamoto, but by providing a scheduling alternative that addresses the problems of the "start now" paradigm. For example, the Takamoto patent generally is concerned with transmission situations wherein quality of service is an issue – *i.e.*, if packets are dropped, they are retransmitted. This need for retransmission itself causes congestion – "Also, Quality of Service scheduling within routers and switches provides bandwidth constraints either at the packet or cell by cell level." *See* Application page 3, lines 7 – 9. By scheduling transmissions the negative effect of bandwidth constraints can be reduced.

For the foregoing reasons, Applicants respectfully submit that independent claim 1 is patentable over the the combination of the Takamoto and Hamai patents. Applicants therefore respectfully request that the rejection of claim 1, and all of the claims which depend from claim 1, be withdrawn.

2. Dependent Claims 2 – 11 and 15 - 16

As set forth above, Applicants respectfully submit that since independent claim 1 is patentable over the prior art of record, each of the claims which depend from claim 1 are similarly patentable. Nonetheless, Applicants hereby submit the following additional remarks supporting the patentability of dependent claims 2 – 11 and 15 – 16.

With respect to paragraph 4 and claims 2 – 3, Applicants respectfully request that the Examiner identify exactly where in the portion cited by the Examiner any discussion of price occurs. Since claim 2 recites that "the digital information is transmitted at a first price" and Hamai recites no such disclosure, Applicants respectfully request that the Examiner withdraw the rejection of claim 2 for this additional reason. Regarding claim 3, the claim recites a step "where the digital information is rejected for transmission if the time required to transmit is more than the difference between the transmit time and the end time." By this claim 3 encompasses that portion of Applicants' invention where a digital message cannot be scheduled due to conflicts. The Hamai patent does not disclose that any digital message be rejected for transmission; rather, Hamai describes situations wherein individual data packets are rejected for transmission. Accordingly, Applicants respectfully request that the Examiner withdraw his rejection of claim 3 for these additional reasons.

With respect to paragraph 4 and claims 4 - 5 , Applicants respectfully request that the Examiner identify in figures 18 – 20 or column 12 line 55 to column 14 line 10 where there occurs any description, depiction or suggestion that "information is accepted for transmission at a second price" as recited by claim 4. There is no such disclosure in Takamoto. Regarding claim 5, the cited portion of Takamoto nowhere refers to a step of a method "where the digital information is rescheduled by the scheduler and accepted for transmission at a second price after the information is rejected." Applicants respectfully request that the rejection of claims 4 and 5 be withdrawn for these additional reasons.

With respect to paragraph 6 and claims 6 – 7, Applicants respectfully request that the Examiner identify in the summary of the invention, figures 2 – 3 or column 7 lines 10 – 63 where there occurs a description of receiving an acknowledgement of receipt of the digital information. As discussed previously, the Takamoto patent concerns a method for using sub-ACKs to improve the efficiency of packet transmission; acknowledgments in Takamoto concern packet-level confirmation of successful transmission and not message-level confirmation. The method recited in claim 1 and refined by a step wherein the method "receives an acknowledgement of transmission" as recited in claim 6 do not concern the packet transmission method of Takamoto. With respect to claim 7, a bill is created since a new type of service is being provided; wherein a user can schedule transmissions instead of submitting them for immediate transmission. Since the transmissions happen later in time, an acknowledgement is provided to confirm receipt. Applicants respectfully submit that it is hindsight to suggest that it would have been obvious to generate a bill when Applicants'

invention operates differently from the "start now" paradigm of the prior art. Applicants respectfully request that the Examiner withdraw his rejection of claims 6 and 7 for these additional reasons.

With respect to paragraph 7 and claims 8 – 10, Applicants draw the distinction between the claimed subject matter which refers to an additional step "where one or portions of the digital information are accepted for transmission and transmitted" (claim 8) and the packet transmission algorithm of Takamoto. Again, Takamoto is not concerned with providing a scheduling alternative; rather Takamoto is concerned with improving packet transmission efficiency by using sub-ACKs. The sub-ACKs of Takamoto are used by the packet transmission process itself to insure quality of service and have nothing to do with providing an entity outside of the packet transmission process with an acknowledgement of either the entire message (as in the case of claim 6) or a portion of the message (as in claim 9). In fact, claim 9 does not require an acknowledgement of all portions wherein the method of Takamoto will retransmit sub-packets until sub-ACKs are received for each sub-packet. Applicants respectfully request that the Examiner withdraw his rejection of claims 8 – 10 for these additional reasons.

With respect to paragraph 8 and claim 11, Applicants respectfully direct Examiner's attention to those portions of Applicants' specification which refer to the staggering of information transmission over time. This staggering, which is recited in claim 11, does not concern the retransmission of sub-packets when sub-ACKs are not received as depicted in Figures 18 – 20 and described in column 12 line 55 to column 14 line 10 of Takamoto. Applicants respectfully request that the Examiner withdraw the rejection of claim 11 for these additional reasons.

With respect to paragraph 9 and claim 16, Applicants direct the Examiner to the previous descriptions of the differences between Applicants' invention and the Hamai reference. As discussed previously, the method described in the Hamai patent concerns a packet generating method in which time information is generated for each data packet. There is nothing recited in claim 1, or claim 16 which depends from claim 1, that requires the generation of time information for each data packet. Rather, claim 16 concerns the rescheduling of retransmission of the digital information itself, and not individual packets into which the digital information may be divided. Applicants respectfully request that the Examiner withdraw the rejection of claim 16 for these additional reasons.

With respect to paragraph 10 and claim 17, Applicants direct the Examiner to the previous descriptions of the differences between Applicants' invention and the Takamoto reference. Again, Applicants' invention is not concerned with the particulars of a packet transmission method; neither does it require the use of sub-ACKs as in the case of Takamoto. Applicants respectfully request that the Examiner withdraw the rejection of claim 17 for these additional reasons.

With respect to paragraph 11 and claims 18 – 19, Applicants again direct the Examiner's attention to the previous description of the differences between the Applicants' invention and the Hamai patent. The Hamai patent is concerned with an improved packet transmission method in which time data is generated for each packet. If the time period corresponding to the time data of a packet has not occurred then in the method of the Hamai patent, the packet is not transmitted. Claim 1, and claims 18 and 19 which depend from claim 1, are not concerned with the particulars of a packet

transmission method, and do not concern assigning time data to each data packet. Applicants respectfully request that the Examiner withdraw the rejection of claims 18 and 19 for these additional reasons.

D. Rejection of Claims 12 – 15 under 35 U.S.C. § 103(a)

In paragraph 12, the Examiner rejected claims 12 – 15 under 35 U.S.C. § 103(a) as being unpatentable over the Takamoto patent in view of the Hamai patent as applied to claim 1, and further in view of the Duquesnois patent. As previously described, the Duquesnois patent is concerned with a method for playing a set of multimedia applications in real time. The method of the Duquesnois patent itself sets an internal priority level in order to restore synchronization so that the set of multimedia applications can continue to be played in real time. According to the method, various priority levels are assigned to processes (*e.g.*, an audio decoding and rendering task; a video decoding task; a video rendering task; and a browser display update task) that are cooperating to play back a multimedia segment.

The assignment of various priorities to processes cooperating to reproduce a multimedia segment as in the method of the Duquesnois patent has nothing whatsoever to do with the assignment of a priority level to digital information that is submitted for transmission as in the method of Applicants' invention.

What Applicants mean by "priority" is clear from claim 13: "where the priority is that the digital information is transmitted within a time period" and claim 14: "where the time period is any one or more of the following: overnight, two days, and one week". It is clear from these claims that the "priority" of Applicants' invention as

claimed has nothing to do with the "priority levels" assigned to various processes cooperating to reproduce multimedia segments in the method of the Duquesnois patent.

Finally, the setting of priority levels in the Duquesnois patent enable the replay of multimedia material in real time, whereas the assigning of priorities to digital information in Applicants' invention do *not* concern real time transmission, but rather transmission at a later time.

For these reasons, Applicants therefore respectfully request that the Examiner withdraw the rejection of claims 12 – 15.

IV. Conclusion

The Applicants submit that in light of the foregoing amendments and remarks the application is now in condition for allowance. Applicants therefore respectfully request that the outstanding rejections be withdrawn and that the case be passed to issuance.

Respectfully submitted,

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Date

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